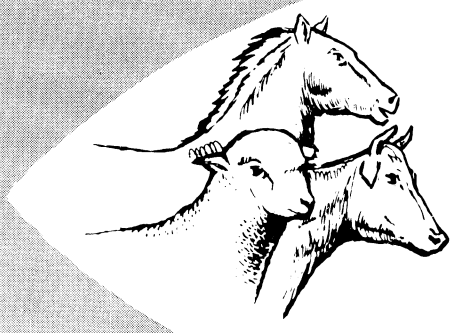
16 PLANTS POISONOUS TO LIVESTOCK IN THE WESTERN STATES



Arrowgrass
Bracken Fern
Chokecherry
Copperweed
Death Camas
Greasewood
Halogeton
Horsebrush
Larkspur
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Milkweed
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Farmers' Bulletin No. 2106

UNITED STATES DEPARTMENT OF AGRICULTURE

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Reducing livestock losses from—

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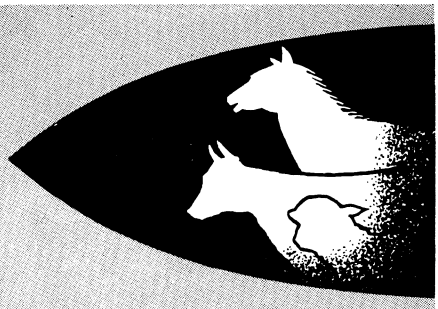


16 Plants Poisonous to Livestock in the Western States

Prepared by the Animal Disease and Parasite Research Division and the Crops Research Division, Agricultural Research Service. Acknowledgment is made to the staff of the Utah Agricultural Experiment Station. Plant sketches used with permission, The MacMillan Company, from W. C. Muenscher, Poisonous Plants of the United States, 1951.

Poisonous plants contain—or produce—substances that may kill animals that eat them. Losses may be heavy when hungry animals graze on ranges where poisonous plants are abundant and good forage is scarce.

By following certain practices, you can reduce livestock losses. One practice to follow is good range management. Another is to be able to identify these plants and to keep animals away from them. Still another is to control or eradicate poisonous plants and to treat affected animals wherever practicable.

This bulletin will help you reduce livestock losses caused by 16 poisonous plants in the Western States. The full-color photographs will aid in identifying the plants. Information on disease symptoms and recommendations for treating animals will also prove helpful. The maps will show you whether livestock poisoning has been reported in your State. It is possible, however, that the plants may grow in locations outside the areas indicated on the maps.

You can obtain more information on plants that are poisonous to livestock by consulting your county agricultural agent, or by writing to your State agricultural experiment station, or to the Animal Disease and Parasite Research Division, U. S. Department of Agriculture, Beltsville, Md

REDUCING LIVESTOCK LOSSES from *Arrowgrass* POISONING in the Western States

The species of arrowgrass that most commonly poison livestock are *Triglochin maritima* and *Triglochin palustris*. They are perennial plants, and are widely distributed in marshy areas throughout the United States.

As long as the ground is moist, the plants are low in toxicity. In dry periods when growth is stunted, the plants become most poisonous.

Sheep and cattle are affected by eating arrowgrass. The toxic substance in the plant is prussic, or hydrocyanic acid. Most of it is in the leaves. Animals may be poisoned if they eat large amounts of leaves in a short time.

Where and When It Grows

The plants grow best in soil covered with water. In such soil they may cover large areas. In moist soil or near springs they sometimes grow in small patches. Arrowgrass starts growth in the spring.

How It Affects Livestock

How much arrowgrass does it take to cause poisoning or death in animals? This depends on the toxicity of the plants and the rate at which the plants are eaten. About one-fiftieth of an ounce of prussic acid (from ¼ to 3 or more pounds of stunted arrowgrass) will kill a 600-pound animal. The toxic dose must be eaten at one time to cause death, as the poison is not cumulative. Death results from respiratory failure.

The following are symptoms of arrowgrass poisoning:

1. **Nervousness**
2. **Abnormal breathing, either very rapid or slow and deep**
3. **Trembling or jerking movement of the muscles**
4. **Blue discoloration of the lining of the mouth**
5. **Spasms or convulsions continuing at short intervals until death due to respiratory failure**

TN-1

Arrowgrass grows in clumps 6 to 18 inches tall. The leaves are basal, fleshy, dark green, grasslike, and half rounded. The flower stalks are slender and may reach a height of 3 to 5 feet. Small, green flowers are set close together on the upper portion of the stalk and appear early in the season. They later develop into golden-brown colored fruits.

N-16032

Arrowgrass grows best in soil that is covered with water; it becomes poisonous during dry periods.

How To Reduce Livestock Losses

Livestock owners should avoid grazing animals in areas where growth of arrowgrass has been retarded by drought.

The action of prussic acid is so rapid that it is usually too late to treat an affected animal after the symptoms are recognized. Some sheep may be saved by having ready and injecting intraperitoneally 20-percent solutions of sodium nitrite and sodium thiosulfate. Sufficient quantities of each solution should be injected to give an animal 1 gram of sodium nitrite (about 5 cc.) and 2 grams of sodium thiosulfate (about 10 cc.). Twice this amount should be given to cattle; it should be administered intravenously. *Note:* This treatment should be given under the direction of your local veterinarian.

Eradication of arrowgrass is impracticable.

REDUCING LIVESTOCK LOSSES from *Bracken Fern* POISONING

in the Western States

Bracken fern [1] is poisonous to cattle and horses. In cattle, poisoning is usually acute and is most likely to occur during the late-summer grazing period, when other feed is scarce. In horses, it usually occurs after animals have fed for several weeks on hay containing considerable quantities of bracken.

Livestock losses are heaviest in eastern areas and in the States bordering the West Coast.

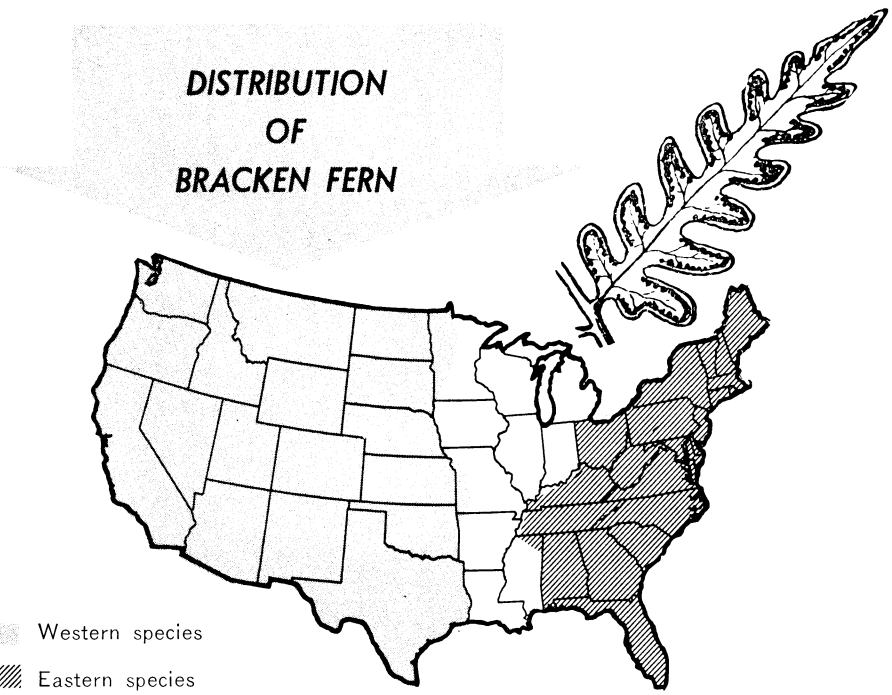
The leaves and other aboveground portions of the plant are poisonous.

Where and When It Grows

These plants grow on burned areas, in woodlands and other shaded areas, and on hillsides, open pastures, and ranges.

The plants start their growth in the spring, and usually they will remain green until the leaves are killed by frost.

[1] *Pteridium aquilinum* var. *pubescens*—found in western United States. *P. aquilinum* var. *latiusculum*—found in eastern United States.



TN-2

Bracken fern has stout, black, horizontal rootstalks. The leaves, or fronds, which grow directly from the rootstalks, are broad, triangular, and divided into three main parts. Each part is segmented. The plant is a perennial and belongs to the fern family.

How It Affects Livestock

Animals show effects of the poison only after eating considerable quantities of bracken for 2 to 4 weeks.

In cattle, the symptoms are:

1. **High fever**
2. **Difficulty in breathing**
3. **Excessive salivation**
4. **Nasal and rectal bleeding**
5. **Congestion of the mucous membrane**

In horses, the symptoms are:

1. **Yellowish tint on mucous membranes of eyes**
2. **Difficulty in breathing**
3. **Unsteady gait**
4. **Drowsiness**
5. **Dilated pupils**
6. **Constipation**
7. **Weak pulse**
8. **Nervousness**
9. **Twitching muscles**
10. **Extreme emaciation**

How To Reduce Livestock Losses

Animals will seldom eat bracken fern if sufficient forage is available. Livestock owners can practically eliminate losses by supplying sufficient forage, either on the pasture or in the form of hay. Supplemental feeding may be beneficial.

Some affected animals can be saved if poisoning is diagnosed early. They may respond to a laxative, such as a saline purgative, raw linseed oil, or mineral oil. Thiamine hydrochloride injected intravenously has been reported helpful in some early or chronic cases. The thiamine hydrochloride treatment should be given by, or under the direction of, your local veterinarian.

Bracken fern can be eradicated. In areas where cultivation is practicable, the plants can be destroyed by cultivating the soil 2 to 3 years. Alternate grazing has been reported effective in preventing abundant plant growth. Keeping tops cut to starve the roots is of value.

REDUCING LIVESTOCK LOSSES from *Chokecherry* POISONING in the Western States

When drought and overgrazing strip the pastures and ranges of grass and other forage, livestock are forced to eat chokecherry. They may become poisoned if they eat considerable quantities of the leaves in a short period.

Sheep are often affected by chokecherry poisoning; occasionally cattle may be affected. Although most losses occur when feed is scarce, some animals may occasionally prefer these plants to other forage. Sheep that have had water are usually hungry and are attracted to chokecherry. Cattle sometimes are poisoned by eating leaves on branches that are trimmed from cultivated cherry trees.

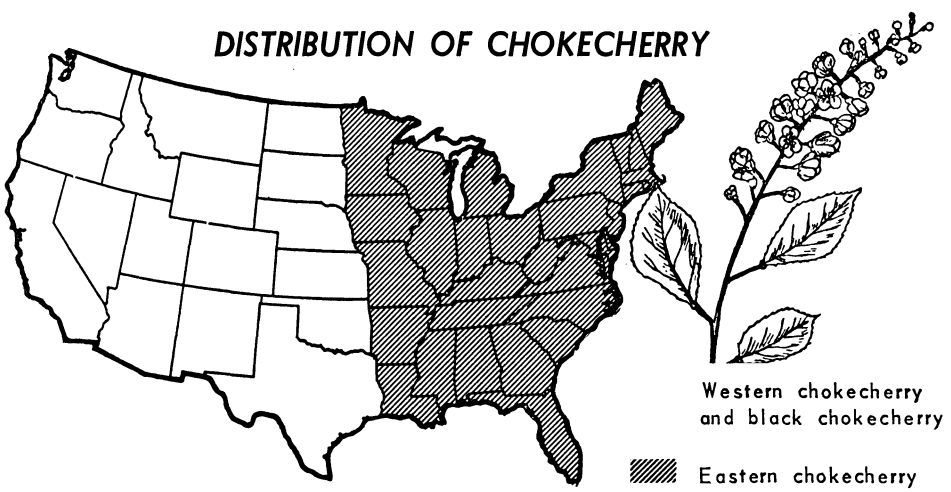
The toxic substance in chokecherry is prussic, or hydrocyanic, acid, which is contained principally in the leaves. The leaves become less toxic as the growing season advances.

Several kinds of chokecherry occur in the United States. Western chokecherry [1] and black chokecherry [2] are plants of the western range States and cause most livestock poisoning. Eastern chokecherry [3] grows as far west as Iowa.

Where and When It Grows

Chokecherry grows where moisture is plentiful. The plants are found in thickets along hillsides and on canyon slopes. They appear

[1] *Prunus virginiana* var. *demissa.*
[2] *P. virginiana* var. *melanocarpa.*
[3] *P. virginiana.*



TN-3

Chokecherry is a shrub or small tree that has dark-green, glossy leaves. It bears masses of white flowers in long clusters in the spring, and many small purple to black cherries in the fall. The plant belongs to the rose family.

as shrubs or small trees among willows, poplars, and alders that grow along mountain streams.

Chokecherry starts growth early in the spring; but is slower growing as the elevation increases.

How It Affects Livestock

Two to 4 ounces of green leaves may contain enough prussic acid to kill a 100-pound sheep. For chokecherry to be fatal, an animal must eat a toxic dose in a relatively short period—30 minutes to an hour. Both wilted and fresh leaves are poisonous.

The following are symptoms of chokecherry poisoning:

1. **Nervousness**
2. **Abnormal breathing, either very rapid or slow and deep**
3. **Trembling or jerking movement of the muscles**
4. **Blue discoloration of the membranes of the mouth**
5. **Spasms or convulsions may develop and continue at short intervals until death results from respiratory failure**

How To Reduce Livestock Losses

Livestock owners should avoid grazing hungry or thirsty animals where chokecherry is abundant.

The action of prussic acid is so rapid that it is usually too late to treat an affected animal after the symptoms are recognized. Some sheep may be saved by having ready and injecting intraperitoneally 20-percent solutions of sodium nitrite and sodium thiosulfate. Sufficient quantities of each solution should be injected to give an animal 1 gram of sodium nitrite (about 5 cc.) and 2 grams of sodium thiosulfate (about 10 cc.). Twice this amount should be given to cattle; it should be administered intravenously. *Note:* This treatment should be made under the direction of your local veterinarian.

Eradication of chokecherry is not practicable on a large scale. In small areas, especially around watering places, these plants may be killed by 2 or more annual treatments with an ester of 2,4,5-T. Drench chokecherry during flowering with a mixture of 2 to 4 pounds of acid equivalent of herbicide per 100 gallons of water. Or, in early spring, thoroughly wet the base of plants with a solution made by mixing 12 to 16 pounds of acid equivalent of an ester of 2,4,5-T in 100 gallons of diesel oil.

REDUCING LIVESTOCK LOSSES from Copperweed POISONING in the Western States

Cattle and sheep may be poisoned by feeding on copperweed [1] when other feed is scarce. Cattle are likely to eat the plants in the fall, when they are being trailed from the summer range; sheep are occasionally poisoned in the fall and winter by eating dry leaves that have fallen to the ground. Most losses occur in cattle.

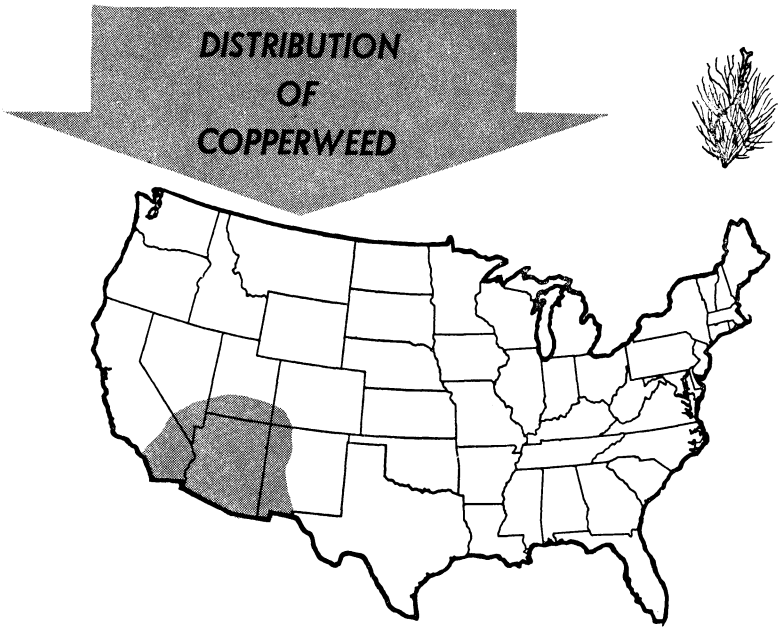
Copperweed contains a toxic alkaloid, which is dangerous at all times. The leaves are most toxic at maturity.

Where and When It Grows

Copperweed is found in the Colorado River drainage area—from southwestern Colorado and southeastern Utah to southern California. The plants grow along old stream beds or gullies, where moisture is plentiful and the soils are usually high in salt.

Copperweed is a perennial plant; it starts growth in the spring, and the flowers appear during July and August.

[1] *Oxytenia acerosa.*



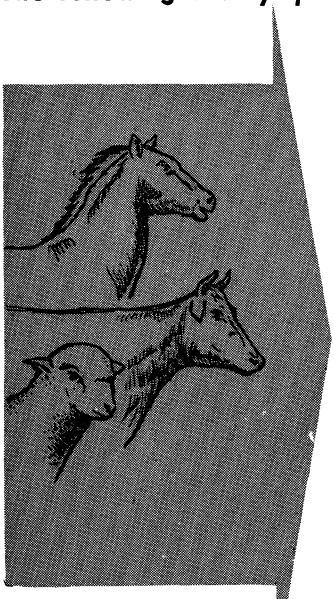
TN-4

Copperweed may reach a height of 3 to 5 feet. A large number of stems usually grow from the crown, and show little branching. The leaves are deeply cut into 3 or 5 long, narrow sections. The small flowering heads are orange-yellow when mature. It belongs to the sunflower family.

How It Affects Livestock

A 100-pound animal will usually die in 1 to 3 days if it eats about a half-pound of green copperweed leaves.

The following are symptoms of copperweed poisoning:



1. **Loss of appetite**
2. **Depression**
3. **Weakness**
4. **Usually some struggling**
5. **Coma**

How To Reduce Livestock Losses

Animals will seldom eat a toxic amount of copperweed if other forage is available. To reduce losses, provide adequate forage at all times. You can do this by careful herding and good range management. Supplemental feeding is beneficial before animals are driven through heavily infested copperweed ranges.

There is no effective treatment for copperweed poisoning. On some ranges, it may be practicable to eradicate the plants by grubbing.

REDUCING LIVESTOCK LOSSES from *Death Camas* POISONING in the Western States

Death camas is the common name of several species of plants that are poisonous to livestock. The more toxic of these species are grassy death camas,[1] meadow death camas,[2] foothill death camas,[3] and Nuttall's death camas.[4] They are found principally in the western range States.

Sheep are most likely to be affected by feeding on death camas, but occasionally cattle and horses are affected. Losses occur in the spring, when green forage is scarce and animals eat the toxic plants.

Death camas contains one or more toxic alkaloids, which are distributed throughout the plant. Animals are poisoned by eating toxic amounts of the leaves, stems, and flowers. The plants are dangerous at all times.

Bulbs cause serious illness if eaten by humans.

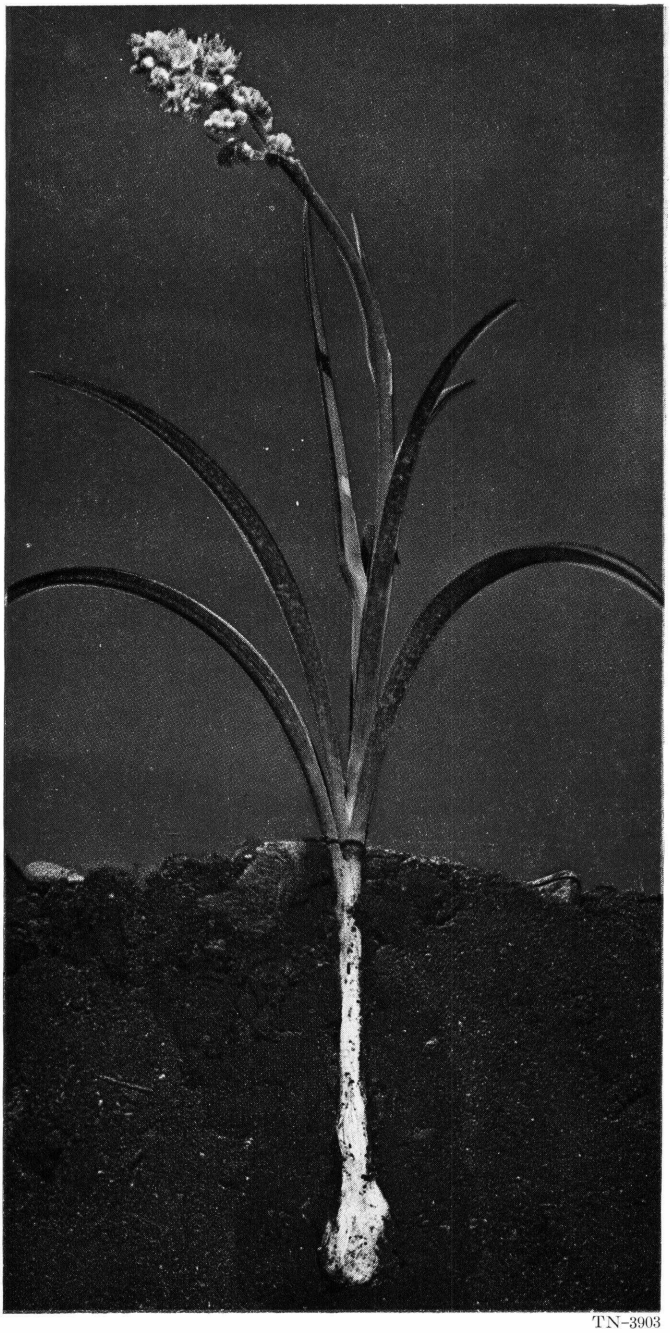
Where and When It Grows

Some species thrive on sandy plains, and others in the drier, rocky foothill areas. The more toxic species are seldom found above elevations of 8,000 feet.

The leaves appear early in the spring, and are soon followed by the flower stalk. At higher elevations, the plants generally flower in late June and July.

[1] *Zigadenus gramineus.*
[2] *Z. venenosus.*
[3] *Z. paniculatus.*
[4] *Z. nuttallii.*

Western species



TN-3903

Death camas has grasslike leaves that grow from a deeply buried bulb, which is odorless. Its flowers are yellowish white and grow in clusters at the top of a stalk, which may be 4 to 18 inches tall. The plant is a perennial and belongs to the lily family.

How It Affects Livestock

Death camas may affect an animal's nervous system, respiration, and heart. A 100-pound sheep may die if it eats ½ to 2 pounds of green foliage. The amount of foliage that will cause an animal's death depends on the species of plant eaten. Severely poisoned animals usually die; those less seriously affected may recover.

Symptoms of death camas poisoning

1. **Rapid breathing**
2. **Excessive salivation**
3. **Nausea**
4. **Weakness and staggering**
5. **Convulsions**
6. **Coma**

How To Reduce Livestock Losses

Livestock owners can reduce losses by following good management practices: (1) Keep animals off death camas ranges until adequate forage is available. (2) Give animals supplemental feed. (3) Seed range to nutritious and palatable vegetation if this is practicable.

There is no effective treatment for death camas poisoning.

Early in the season when plants have 3 to 6 leaves, death camas can be eliminated by spraying with an ester of 2,4-D at the rate of 1.5 pounds of acid equivalent per acre. Spraying after the flowering stalks appear is not effective.

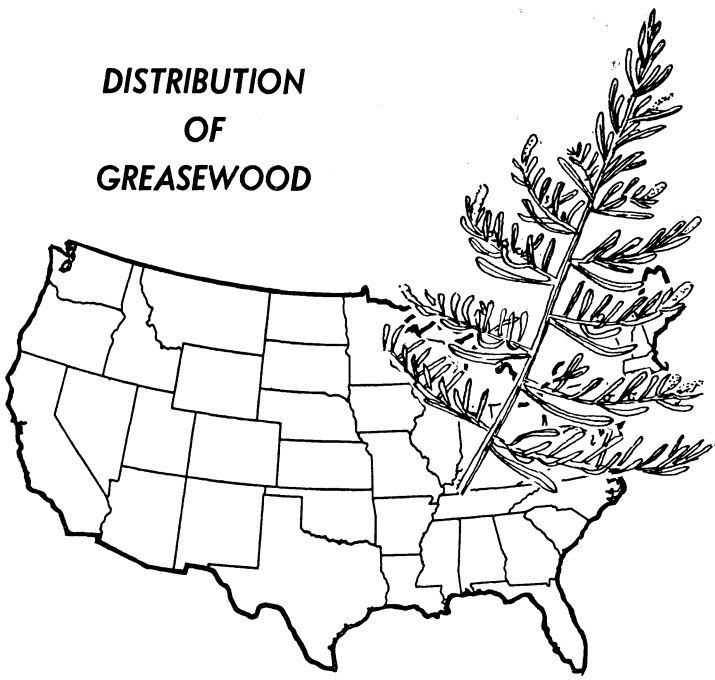
REDUCING LIVESTOCK LOSSES from *Greasewood* POISONING in the Western States

Greasewood,[1] a perennial shrub of the western range States, is a good forage plant when cattle eat it in moderate amounts with other forage, but it may be highly toxic. It is especially toxic for sheep, when they eat it in large amounts with little or no other feed. The toxic substances are sodium and potassium oxalates, which are found in the leaves and other aboveground portions of the plant. Greasewood increases in toxicity as the growing season advances.

Where and When It Grows

The plants grow principally in the heavy saline to saline-alkaline soils of semiarid regions. They are found on the flood plains, along dry washes and gullies, and in other areas where the soil is sufficiently moist. Greasewood starts its growth in early spring. The leaves remain succulent until fall, when they freeze and dry.

[1] *Sarcobatus vermiculatus.*



TN-6

Greasewood is 2 to 5 feet tall, and has rigid, spiny branches. The bark is smooth and white, and the leaves are narrow, thick and pale green. The flowers are small and light green to whitish. The plant belongs to the goosefoot family.

How It Affects Livestock

A sheep may die if it eats about 2 pounds of green leaves and fine stems in a short period without other forage. Symptoms of poisoning may develop 4 to 6 hours after the animal eats a toxic dose.

Early symptoms include:

1. **Dullness**
2. **Loss of appetite**
3. **Lowering of the head**
4. **Reluctance to follow the band**

Advanced symptoms include:

5. **Drooling and a white froth about the mouth**
6. **Nasal discharge**
7. **Progressive weakening**
8. **Rapid and shallow breathing**
9. **Coma**

How To Reduce Livestock Losses

Livestock losses can be reduced by (1) providing a range that supports other forage, and by (2) keeping hungry animals away from greasewood ranges at all times. Supplemental feeding with grain or alfalfa hay pellets containing at least 10 percent dicalcium phosphate at the rate of ½ pound per head as the animals are trailed through greasewood areas will be effective in preventing the poisoning.

Annual treatments with an ester of 2,4-D will control the shrub. Apply the herbicide at a rate of 2 pounds of acid equivalent per acre when greasewood is actively growing. Control may have little value unless grasses are available to replace greasewood.

REDUCING LIVESTOCK LOSSES from *Halogeton* POISONING in the Western States

Halogeton,[1] an annual plant of the Western States, has received widespread attention since 1942, when it was reported poisoning sheep near Wells, Nev.

Sheep are most frequently poisoned by feeding on halogeton; cattle may be affected occasionally. Most losses occur when hungry animals are trailed through heavily infested areas.

The toxic substances in halogeton are sodium and potassium oxalates, which are contained in the leaves and all aboveground portions of the plant. Halogeton becomes more toxic as the growing season advances, and is most dangerous when it is frozen and dry.

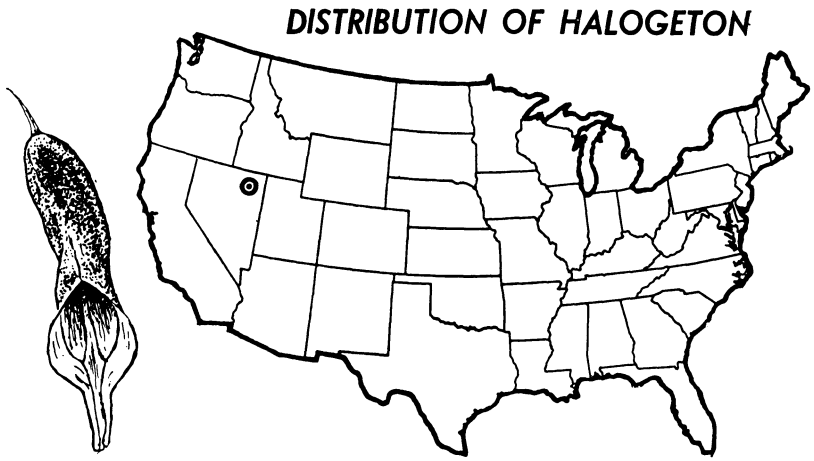
Characteristics that make this plant particularly troublesome are adaptability to various conditions of soil, topography, and climate; and prolific seeding habits. The seed is spread by wind, water, animals, vehicles, and other means.

If other desirable forage is available and if animals can select their own feed, they will seldom eat toxic amounts of halogeton.

Where and When It Grows

Halogeton thrives in the salty soils of semiarid regions, especially where soils have been disturbed or where native plant cover is thin or low in vigor. Dense stands are found on burned-over areas, overgrazed ranges, dry lake beds, and abandoned farmlands, and along railroad beds, road margins, and sheep trails.

[1] *Halogeton glomeratus.*



⊙ Plant first identified in Wells, Nevada, 1935.

DON'T allow halogeton to become established on your range. If you find the plant, notify your county agent and begin controls promptly.

TN-7

Halogeton is often mistaken for Russian thistle. The stems are tinged with red or purple, and are branched at the base. The leaves, which grow in little bunches along the stems, are round, fleshy, and wiener shaped. The seeds are usually enclosed in winglike bracts, which almost cover the plant at maturity. The plant belongs to the goosefoot family. A distinctive characteristic of halogeton is a small single hair, about one-twelfth of an inch long, that grows on the end of each leaf.

Halogeton seeds begin germinating late in the winter and continue to do so throughout the growing season. Plants that start growth in August may produce a new seed crop in November. Germination requires certain temperature and moisture conditions. In the absence of adequate moisture, seeds may remain viable a year or longer.

How It Affects Livestock

About 12 ounces of halogeton will kill a sheep that has been without feed for a day or longer. About 18 ounces is necessary to kill one that has been feeding on other forage. First symptoms of halogeton poisoning may occur in 2 to 6 hours after an animal eats a lethal dose.

Early symptoms include:

1. **Dullness**
2. **Loss of appetite**
3. **Lowering of the head**
4. **Reluctance to follow the band**

Advanced symptoms include:

5. **Drooling and white froth about the mouth**
6. **Nasal discharge**
7. **Progressive weakening**
8. **Rapid and shallow breathing**
9. **Coma**

How To Reduce Livestock Losses

You can reduce livestock losses by maintaining a range that supports good forage and by keeping hungry animals away from halogeton at all times. Supplemental feeding of ¼ to ½ pound daily of alfalfa or grain pellets containing 10 percent of dicalcium phosphate prevents halogeton poisoning when animals are being trailed through or allowed to graze in heavily infested areas. If animals are shipped by train or truck and unloaded in halogeton-infested areas, their feeding must contain the above supplement or serious losses may occur. Supplementation need only to be continued until the animals are out of the halogeton-infested areas, or their hunger has been satisfied with other types of forage plants.

Halogeton is a prolific seed producer. New plants that become established between February and mid-August produce a seed crop by the end of the growing season. Some of these seeds may remain viable in the soil for as long as 10 years.

If possible, treat halogeton between June 20 and July 10—the period before seeds are completely formed. At this time, proper treatment kills 97 to 100 percent of the plants. Use a low volatile ester of 2,4-D in water, applied at a rate of 2 pounds of acid equivalent per acre.

After July 10, use a spray containing 2,4-D and diesel oil, applied at a rate of 4 pounds of acid equivalent per acre. This spray kills halogeton, but may not prevent all seed production.

CAUTION: Apply 2,4-D with extreme care to protect broadleaf perennials. Use the herbicide only to treat small infestations of halogeton; continue annually for 6 to 10 years. Treatments should prevent *all* seed production until eradication is completed.

Consult your county agricultural agent about methods of controlling heavy infestations of halogeton.

REDUCING LIVESTOCK LOSSES from *Horsebrush* POISONING in the Western States

Two species of horsebrush, which grow in the Great Basin region of the West, are known to be poisonous to livestock—little-leaf horsebrush [1] and gray horsebrush.[2] Sheep that feed on them may contract bighead, or swellhead. The most conspicuous symptom of the disease is a swelling of the head when animals are exposed to sunlight.

Under range conditions, only sheep are affected by horsebrush. Most losses occur when animals are trailed through heavily infested areas that do not support good forage. Hungry sheep often will eat toxic quantities of horsebrush after watering.

All plant parts are poisonous, but sheep eat only the leaves and fine stems. Both species are highest in toxicity when they are making their most active growth—from April to late July—and lowest in toxicity after flowering and during the dormant stage. Little-leaf is about two-and-a-half times more toxic than gray horsebrush.

Where and When It Grows

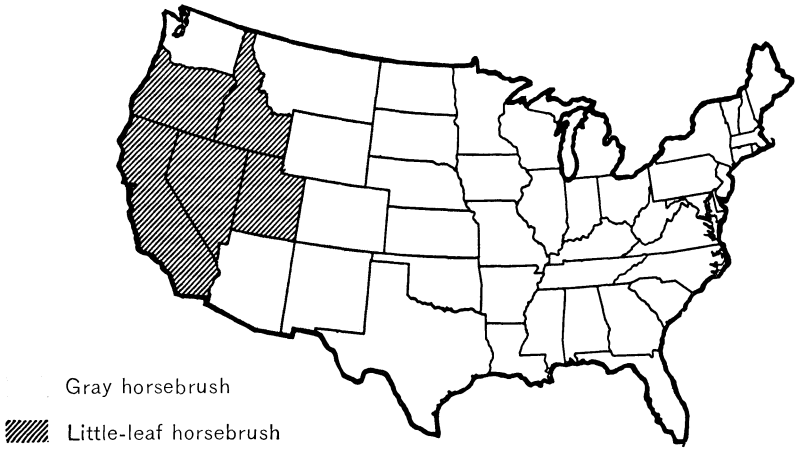
Little-leaf horsebrush: It is most abundant on benchlands, well-drained slopes, and low elevations on the winter ranges; it is often found in areas of lava formations.

This species is one of the earliest desert range plants to start growth in the spring; it is usually in full flower by the end of May. Its leaves dry up and drop off in early June, and the plant remains dormant until the following spring. It makes little growth in extremely dry seasons.

[1] *Tetradymia glabrata.* It also is called smooth horsebrush, spring rabbit brush, coal-oil brush, lizard shade, rat brush, dog brush.

[2] *T. canescens* var. *inermis.* It also is called spineless horsebrush.

DISTRIBUTION OF HORSEBRUSH



Gray horsebrush

Little-leaf horsebrush

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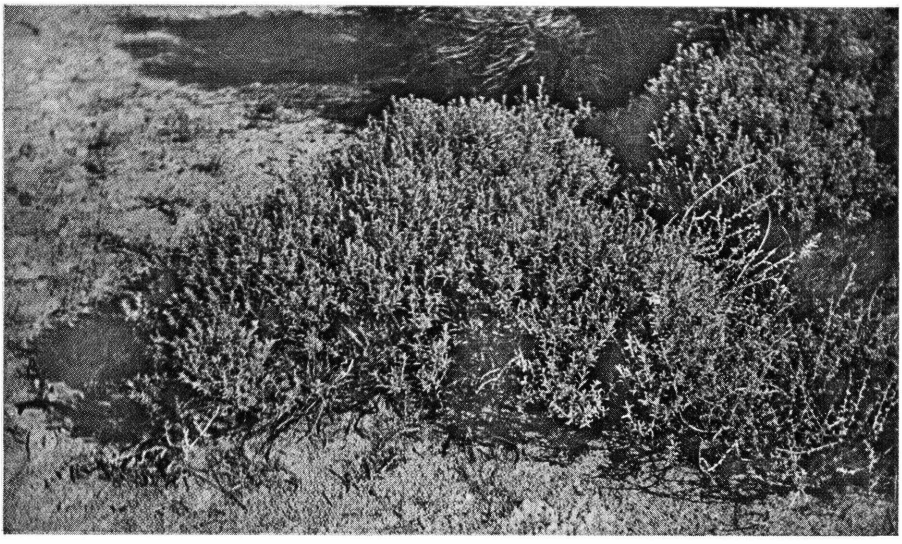


BN-14517-X

Little-leaf horsebrush (top) is a strong-scented shrub that often reaches a height of 3 feet. The stems are abundantly branched; the leaves are slender and come to a sharp point. The flowers are yellow when they first appear, and change to gray after they mature and dry.

Gray horsebrush (bottom) reaches a height of about 2 feet. Hairs that cover the stems and leaves give the plant a silvery appearance. The leaves, which are broader and longer than those of the little-leaf species, are up to 1 inch long.

Both plants are perennial and belong to the sunflower family.

Gray horsebrush: It is most abundant in sagebrush areas and foothill regions; it is also scattered throughout portions of the little-leaf horsebrush areas.

Gray horsebrush starts growth later than little-leaf horsebrush. The plant flowers in June or July and usually remains green until fall.

How It Affects Livestock

Scientists believe that bighead occurs after certain toxic substances in horsebrush get into the animal's bloodstream and create a condition that sensitizes the skin to light. The belief is supported by the fact that the swelling always occurs in light-skinned animals and is more severe in direct sunlight.

The liver is the organ most seriously affected by little-leaf horsebrush poisoning. Animals may die as a result of liver injury before any head swelling occurs. Many ewes abort from eating a toxic dose of horsebrush; a large percentage of them may become sterile.

About ½ pound of leaves and fine stems of little-leaf horsebrush, or 1¼ pounds of leaves and stems of gray horsebrush, will usually cause bighead in a 100-pound sheep.

The following are symptoms of horsebrush poisoning:

1. **Depression**
2. **Weakness (death sometimes occurs without other symptoms within a few hours)**
3. **Sensitiveness and irritation about the head, followed by swelling of the head, the neck, the ears, the eyelids, and the nose**

How To Reduce Livestock Losses

Bighead is principally a trail disease. Herders can prevent losses by avoiding horsebrush ranges while trailing sheep, and by not permitting animals to graze in infested areas immediately after watering.

Sheep often recover from bighead caused by the gray horsebrush; but animals affected from eating little-leaf horsebrush usually die. Affected animals should be placed in the shade, if possible, given water and feed, and left undisturbed for a few days. Supplemental hay feeding may be beneficial.

Methods of eradication have not been developed.

REDUCING LIVESTOCK LOSSES from Larkspur POISONING in the Western States

Larkspur probably causes more cattle losses in the western range States than any other poisonous plant. Losses in sheep or horses rarely occur.

These plants are commonly called tall larkspurs or low larkspurs, depending on their size and growth habits. Although all larkspur is poisonous, some species seldom, if ever, cause cattle losses. Three of the most poisonous species are *Delphinium barbeyi*, tall larkspur, *D. nelsonii* and *D. tricorne*, low larkspurs.

Tall larkspurs reach their poisonous peak during early summer, but may continue to be dangerous until after maturity in the fall. Low larkspurs are poisonous throughout the life of the plant.

Cattle will feed on larkspur even though good forage is available. Losses are apt to be heavy if animals are allowed on larkspur ranges that contain the toxic species.

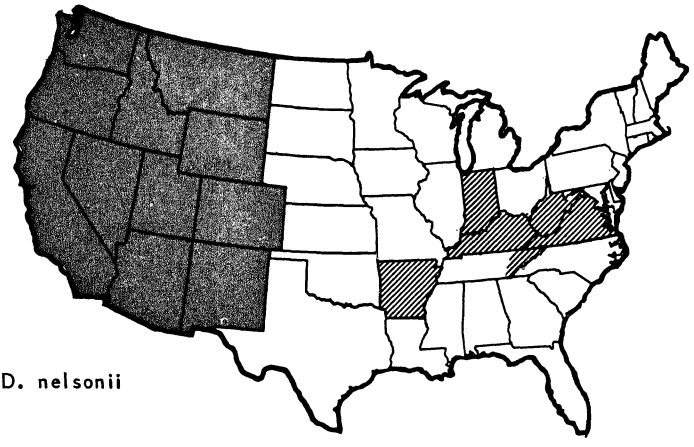
All plant parts, especially the leaves, are poisonous. The toxic substance is an alkaloid.

Where and When It Grows

Tall larkspurs grow on the higher ranges at elevations of 6,000 to 11,000 feet; they are common in moist areas on mountain ranges, under aspen, and along streams.

Low larkspurs are found on open hillsides and in parks at elevations of 8,000 feet and below; they are common on foothills and sagebrush ranges.

DISTRIBUTION OF LARKSPUR



D. barbeyi and D. nelsonii

D. tricorne

TN-10

Tall larkspurs grow up to 5 feet tall, and look like the garden flower delphinium. The flowers are blue, and the leaves are broad and divided into segments.

Low larkspurs grow up to 2 feet tall. Like tall larkspurs, the flowers are blue, but the leaves are divided into finer, narrower segments.

SN-1

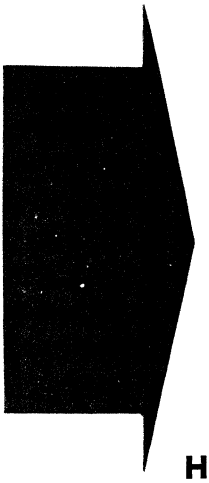
The plant is a perennial and belongs to the crowfoot family.

Tall larkspurs usually start growth in May or June, depending on elevation. Low larkspurs start growth in early spring, and usually mature by June or early July. When they mature, leaves dry up.

How It Affects Livestock

An animal may be poisoned if it eats a relatively small amount of larkspur in a short period. One-half pound of the more toxic species per 100 pounds of animal weight may cause poisoning.

The following are symptoms of larkspur poisoning:



1. **Staggering**
2. **Falling**
3. **Nausea**
4. **Excessive salivation**
5. **Frequent swallowing**
6. **Quivering of muscles**
7. **Retardation of heart action**
8. **Paralysis of respiratory centers**

How To Reduce Livestock Losses

Livestock losses can be reduced by keeping cattle off larkspur ranges until forage is available. In dangerous areas, animals should be fenced out of dense patches.

There is no simple effective treatment for larkspur poisoning. Placing an affected animal on a slope with its head uphill may prevent bloating.

When it is actively growing, larkspur may be controlled by applying esters of 2,4,5-T or silvex at rates of 2 to 4 pounds of acid equivalent per acre. To be effective, treatment must be applied before flower buds are formed. Repeat treatments annually until all plants are destroyed.

An alternate control method is to sprinkle a mixture of 1½ pounds of acid equivalent of 2,4,5-T and 100 pounds of ammonium sulfamate on the ground around the base of the larkspur plant. Use enough of the mixture to be seen. Apply at any season that larkspur plants are found; the mixture is effective throughout the year.

REDUCING LIVESTOCK LOSSES from Locoweed POISONING in the Western States

Horses, cattle, sheep, and goats are frequently poisoned by eating locoweeds.

"Locoed" horses seldom recover completely, and are of little value thereafter as saddle and work animals. Cattle being fed for beef after apparent recovery rarely make economic gains. Calf losses caused by abortion are frequently high.

Animals ordinarily will not eat locoweeds unless feed is scarce. But once they start eating it, they soon acquire the "loco habit," and may continue to feed on these plants even when good forage is available.

The term "locoweeds" refers to certain plants in the pea family. Listed below are some of the more poisonous species.

Common Name	Botanical Name	Distribution
White loco	*Oxytropis lambertii*	Montana and North Dakota, south to Arizona, New Mexico, and Texas
Purple, or wooly, loco	*Astragalus mollissimus*	South Dakota to western Texas to New Mexico
Blue loco	*A. lentiginosus*	Eastern Washington, Idaho, Utah, Colorado, Nevada, and California
Bigbend loco	*A. earlei*	Western Texas and southern New Mexico
Western loco	*A. wootoni*	Eastern Arizona, southern New Mexico, and southwestern Texas

Locoweeds are poisonous during all stages of growth, and may be dangerous throughout the year—even when the plants have matured and dried. All parts are toxic. The plants have shown only a slight decrease in toxicity after being stored in dry form for 2 to 3 years.

Where and When It Grows

These plants are commonly found on foothills and plains, and in semi-arid areas. They start growth in late fall, in winter, or in early spring, depending on the locality, species, and available moisture.

TN-3902

Locoweeds grow in tufts or clumps from large roots. They have compound leaves and pealike flowers, which may be white, blue, or purple, depending on the species.

The plants are mostly perennials, and are called locoweeds because of the "crazy" behavior exhibited by poisoned animals.

How It Affects Livestock

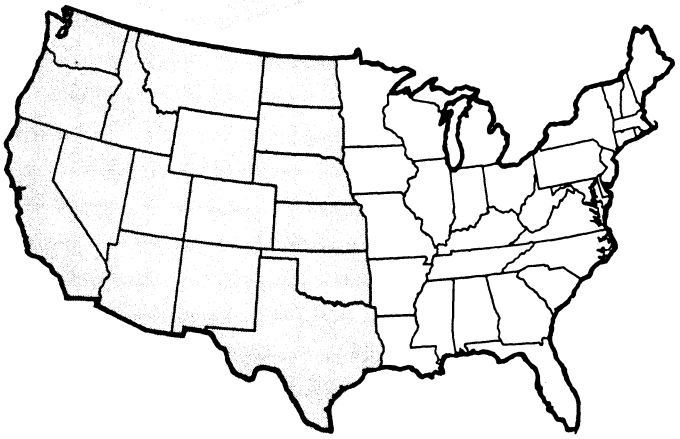
Usually an animal must eat considerable quantities of locoweeds for 2 to 5 weeks before death occurs. Symptoms of poisoning will usually appear within 2 to 3 weeks of continuous grazing on the plants.

Abortion frequently occurs in cattle and sheep from acute poisoning.

Symptoms of locoweed poisoning

1. **Loss of flesh**
2. **Irregularity of gait**
3. **Loss of sense of direction**
4. **Nervousness**
5. **Weakness**
6. **Withdrawing from other animals**
7. **Lack of muscular control**
8. **May react violently when disturbed**

LOCOWEED DISTRIBUTION



How To Reduce Livestock Losses

Livestock owners can reduce losses by keeping animals off locoweed ranges until good forage is available.

Treatment is not effective in locoweed poisoning.

To control locoweed, spray actively growing or budding plants with an ester of 2,4-D at the rate of 2 to 3 pounds of acid equivalent per acre. If plants are scattered, treatment of individual plants or patches may be more practical.

REDUCING LIVESTOCK LOSSES from Lupine POISONING in the Western States

Many species of lupines grow on grazing lands in the United States. Not all of them are poisonous to livestock. The following table lists the most poisonous species of lupines.

Common Name	Botanical Name	Distribution
Silky lupine	*Lupinus sericeus*	Montana, South Dakota, Wyoming, Idaho, Oregon, and Washington
Velvet lupine	*L. leucophyllus*	Oregon, Idaho, Utah, and Wyoming
Silvery lupine	*L. argenteus*	North Dakota, Wyoming, Colorado, New Mexico, Arizona, Utah, and Idaho
Tailcup lupine	*L. caudatus*	Oregon, Nevada, California, Idaho, Utah, and Wyoming
Perennial lupine	*L. perennis*	Maine to Minnesota south to Florida and Louisiana

Sheep are frequently poisoned by feeding on lupine seeds; other animals are seldom poisoned. Losses may be especially heavy when hungry animals are trailed through lupine ranges in the late summer. Sheep are occasionally poisoned by eating plants that have been cut and dried.

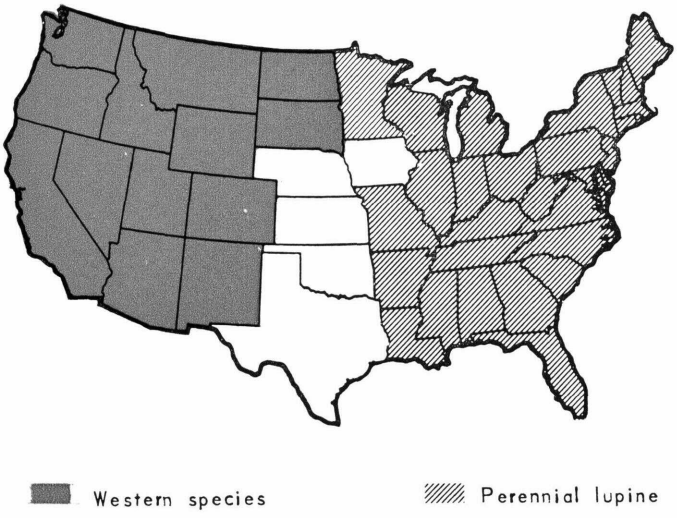
Poisonous lupines are dangerous from the time they start growth in the spring until they dry up in the fall. Most of them are especially dangerous in the late summer, when in the seed stage. The pods and seeds retain their poisonous properties after the plants have matured.

The toxic substances in lupines are alkaloids.

Where and When It Grows

These plants grow on foothills and mountain ranges in sagebrush and aspen areas. The five species listed above are perennials (some lupines are annuals); they usually start growth fairly early in the spring, flower in June, and form seeds in July and August.

DISTRIBUTION OF LUPINE



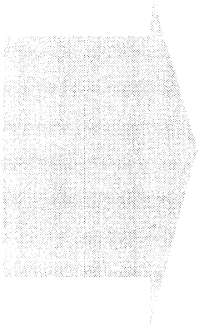
TN-12

The color of lupine flowers varies with the species; although generally blue, the flowers may be white, pink, yellow, or a mixture of white and blue. The leaves are composed of several leaflets, which vary in number and radiate in fingerlike fashion from a common point. The plant belongs to the pea family.

How It Affects Livestock

The amount of lupine necessary to kill an animal varies with the plant species. An animal may eat comparatively large quantities of the plant without injury, if it does not eat a toxic dose at any one time.

The following are symptoms of lupine poisoning:



1. **Nervousness**
2. **Reluctance to follow the band**
3. **Difficulty in breathing**
4. **Loss of normal muscular control**
5. **Frothing of the mouth**
6. **Convulsions**
7. **Coma**

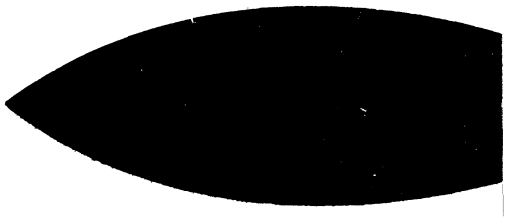
How To Reduce Livestock Losses

Sheep will seldom eat a toxic dose of lupine if satisfactory forage is available. Losses can be reduced by keeping hungry animals away from lupine patches in the late summer, when the plant is highly toxic, and from dense plant stands at all times. Supplemental feeding is beneficial, especially when trailing animals through lupine ranges.

There is no effective treatment for lupine poisoning.

Spray actively growing plants after they are 5 inches high but before they bloom; use an ester of 2,4-D or 2,4,5-T applied at the rate of 2 pounds of acid equivalent per acre.

REDUCING LIVESTOCK LOSSES from in the Western States



Several species of milkweeds may poison range animals. Species that cause heavy livestock losses are listed below in order of toxicity.

Common Name	Botanical Name	Distribution
None	*Asclepias labriformis*	Eastern Utah
Western whorled milkweed	*A. subverticillata*	Southern Utah and Arizona to western Kansas and western Texas
Woolly pod milkweed	*A. eriocarpa*	California
Mexican whorled milkweed	*A. fascicularis*	Washington and eastern Idaho to southern California
Eastern whorled milkweed	*A. verticillata*	Atlantic Coast and Mississippi Valley

Milkweed poisoning occurs frequently in sheep and cattle and occasionally in horses. Most livestock losses are a result of hungry animals concentrated around milkweed-infested corrals, bed grounds, and driveways. Poisoning also may occur if animals are fed hay containing large amounts of milkweed.

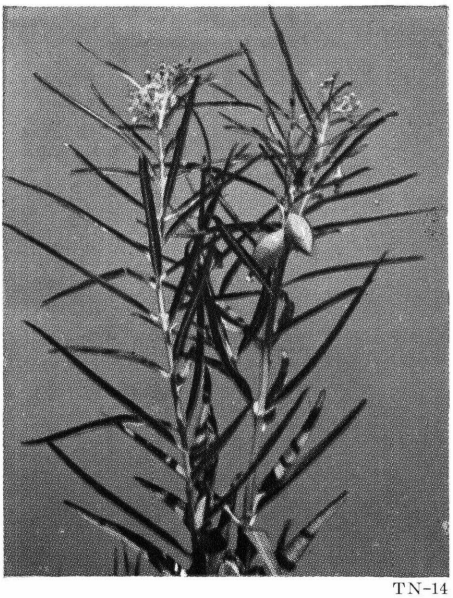
The leaves and other aboveground portions of the plant are poisonous. They contain a resinous substance and several glucosidal substances. Milkweeds are dangerous at all times, but are most poisonous during the active growing season.

Where and When It Grows

These plants are often found in sandy soils of plains and foothills. They grow on ranges and abandoned farms, along roadsides, in pastures, and in ditches, old fields, and other waste places.

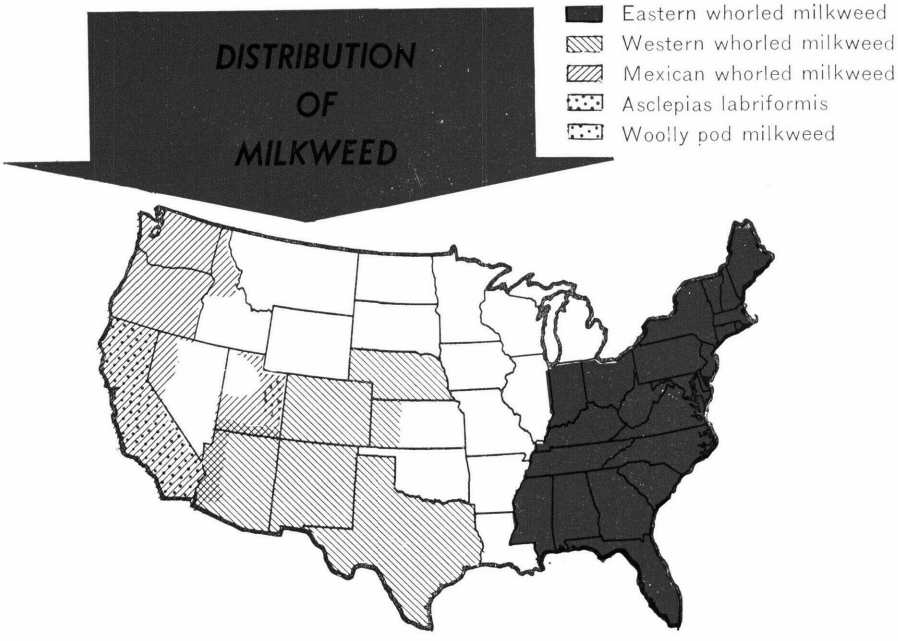
Milkweeds start growth in the early spring.

TN-13



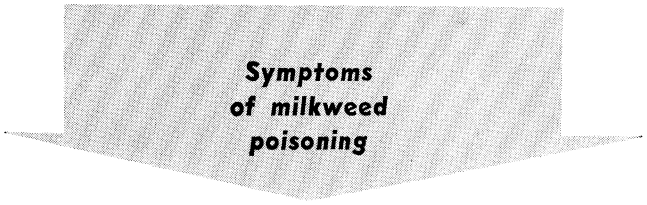
TN-14

Milkweeds grow 1 to 3 feet high. The flowers are usually greenish white and are borne in spreading, umbrellalike clusters. Some species have narrow leaves; others have broad leaves. The plants are called milkweeds because they contain a milky juice that oozes out quickly when any plant part is broken. These plants are perennials.



How It Affects Livestock

An average-sized sheep that eats 1 to 3 ounces of green leaves of one of the more toxic species is likely to die of poisoning. It may die within a few hours or it may live 2 to 4 days.



1. Loss of muscular control
2. Staggering and falling
3. Violent spasms
4. Bloating
5. Rapid and weak pulse
6. Difficulty in breathing
7. Respiratory paralysis

How To Reduce Livestock Losses

Animals usually eat milkweeds when good forage is scarce. Livestock owners can reduce losses by keeping animals away from milkweed areas, especially along driveways, when bands of sheep are trailed from one range to another; and do not feed milkweed-contaminated hay. Supplemental feeding is usually beneficial.

When milkweeds cover large areas, eradication is not practical. In small areas, the plants may be killed by repeated treatments with herbicides, such as silvex, 2,4,5-T, 2,3,6-TBA, or amitrole.

REDUCING LIVESTOCK LOSSES from Oak Brush POISONING in the Western States

Two kinds of oak brush may poison cattle that feed on them: Shinnery oak,[1] or shinnery, common in the Southwest; and scrub oak,[2] common in the central part of the Western States.

Cattle losses from oak poisoning are heaviest early in the growing season. This is so because: (1) Oak brush often starts growth before other range plants, making it the only forage available; (2) The plants are most poisonous in the budding and leafing stages. As the leaves mature, oak brush decreases in toxicity.

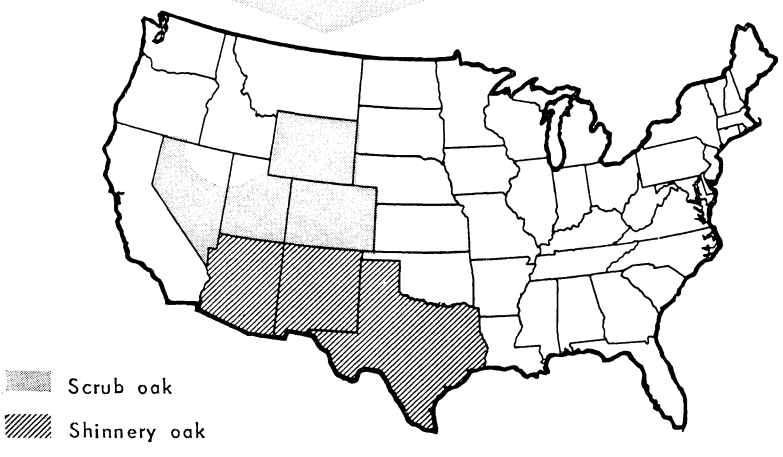
An animal is less likely to become poisoned if it eats oak brush with other forage. It can have up to 40 percent of oak brush in the total ration without suffering any harmful effects.

Where It Grows

Shinnery oak is a low, spreading shrub. It grows in sandy areas, and is primarily found in western Oklahoma, western Texas, and eastern New Mexico. Scrub oak is a shrub or small tree. It grows in dense thickets on foothills and mountain slopes, and can be found up to an elevation of 8,000 feet.

[1] *Quercus havardii* and others.
[2] *Q. gambellii* and others.

OAK BRUSH DISTRIBUTION



TN-15

Oak brush produces small acorns; its leaves are leathery and have wavy margins. Shinnery oak grows 1 to 6 feet high; scrub oak, up to 20 feet high. Oak brush is a woody perennial and belongs to the Fagaceae or beech family.

How It Affects Livestock

Death from oak brush poisoning may occur in a few days to 2 weeks after the cattle first show symptoms.

Symptoms of oak brush poisoning

1. **Animals appear gaunt, and have a tucked-up appearance**
2. **Constipation, frequently followed by profuse diarrhea**
3. **Weakness**
4. **Tendency to remain near water**
5. **Reluctance to follow the herd**
6. **Emaciation**
7. **Mucus in droppings**
8. **Dark-colored urine**
9. **Animals collapse**

How To Reduce Livestock Losses

Livestock losses from oak brush poisoning can be reduced by conservative grazing and proper seasonal use of shinnery and scrub oak ranges.

In shinnery areas of the Southwest, livestock owners should reserve pastures with the least amount of oak brush for early spring grazing. The use of supplemental feed will further help reduce losses.

In scrub oak areas, animals should be kept off oak brush ranges until forage becomes available; be sure animals are not suffering from a depraved appetite because of a lack of phosphorus.

At first signs of poisoning, remove the affected animals from the herd and give them adequate feed and water. In some cases, the use of a mild laxative, such as oil, may be beneficial.

Shinnery oak can be controlled by aerial applications of an ester of silvex or 2,4,5-T. Apply when leaves have reached full size and the plants are actively growing. Use ½ to 1 pound of an acid equivalent of herbicide per acre. Repeat treatments annually until oak is destroyed.

Gambel oak can be controlled by annual aerial applications of an ester of 2,4,5-T applied at the rate of 2 pounds of acid equivalent per acre.

REDUCING LIVESTOCK LOSSES from Rubberweed POISONING in the Western States

Rubberweed [1] may cause serious livestock losses on overgrazed ranges in the summer and in the fall. Losses may also occur when hungry animals are trailed through rubberweed from summer ranges.

Poisoning occurs commonly in sheep and only occasionally in cattle.

The toxic substance, which is contained in the aboveground portions of the plant, has a cumulative effect.

Where and When It Grows

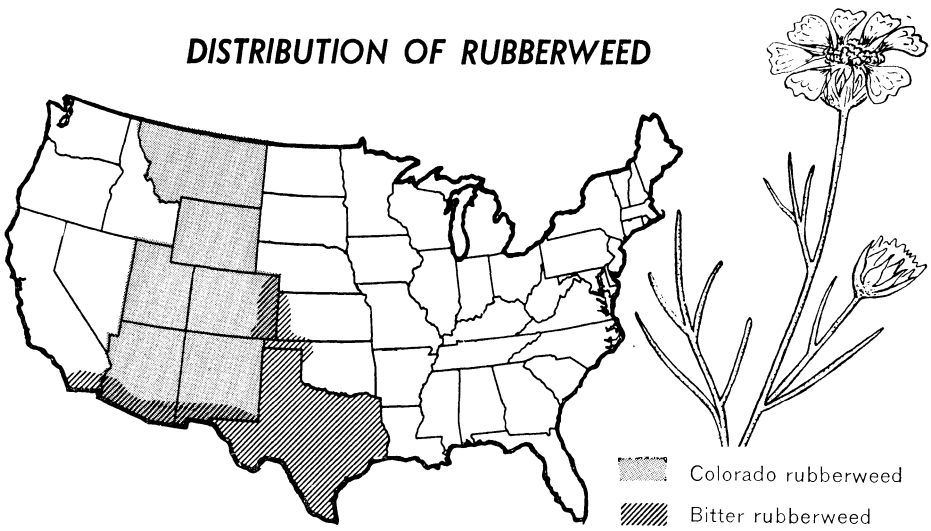
Rubberweed grows in dry soils at elevations of 5,000 to 8,000 feet. It is found mostly on mountains and foothills, and is poisonous to livestock throughout the growing season. It is considered an invader plant, coming in as other forage plants are killed out.

How It Affects Livestock

A 100-pound sheep may die if it eats ¼ to ½ pound of rubberweed daily for 1 to 2 weeks. An animal may die from one large feeding or repeatedly eating small quantities of the plant over a long period.

[1] Other common names are pingue, Colorado rubberweed, and bitter rubberweed. Two species are most poisonous to livestock; *Hymenoxys richardsoni* (*Actinea richardsoni*) and *H. odorata* (*A. odorata*).

DISTRIBUTION OF RUBBERWEED



TN-16

Rubberweed is a small, bushy plant, about 1 foot tall, that grows from a thick, woody stalk. The bases of the stems are covered with a woolly growth. The flowers are asterlike and golden yellow or orange. The plant is a perennial and belongs to the sunflower family. It is called rubberweed because it contains a small amount of rubber.

BITTER RUBBERWEED

Bitter rubberweed, or bitterweed (its scientific name is *Actinea odorata*), is a small annual plant that is related to pingue. Bitter rubberweed and pingue produce similar effects on sheep that feed on them.

Bitter rubberweed is found from southwestern Kansas and central Texas westward across southern New Mexico and southern Arizona to southeastern California. It has caused severe sheep losses in the Edwards Plateau region of Texas.

Symptoms of rubberweed poisoning

1. **Depression**
2. **Weakness**
3. **Vomiting**
4. **Bloating**
5. **Frothing at the mouth**
6. **Green discharge from the nose**
7. **Coma**

How To Reduce Livestock Losses

Animals will seldom eat toxic amounts of rubberweed if desirable forage is available. Heavy losses may be prevented, especially during trailing, by avoiding heavily infested areas or by supplemental feeding.

Livestock owners should practice good range management, and keep hungry animals away from rubberweed ranges at all times. If sheep losses become excessive, it may be advisable to change from sheep to cattle on certain ranges.

There is no effective treatment for rubberweed poisoning.

Control rubberweed when plants are in the prebud and early bud stages and are actively growing by spraying with an ester of 2,4-D applied at a rate of 2 pounds of acid equivalent per acre.

REDUCING LIVESTOCK LOSSES from Sneezeweed POISONING in the Western States

Animals that feed on sneezeweed may become affected with the "spewing sickness." The disease is so named because of its most characteristic symptom—chronic vomiting, or spewing.

Sheep are frequently poisoned by sneezeweed, and cattle are only occasionally poisoned. The animals eat sneezeweed during the summer and fall, when other forage is scarce or has become less palatable.

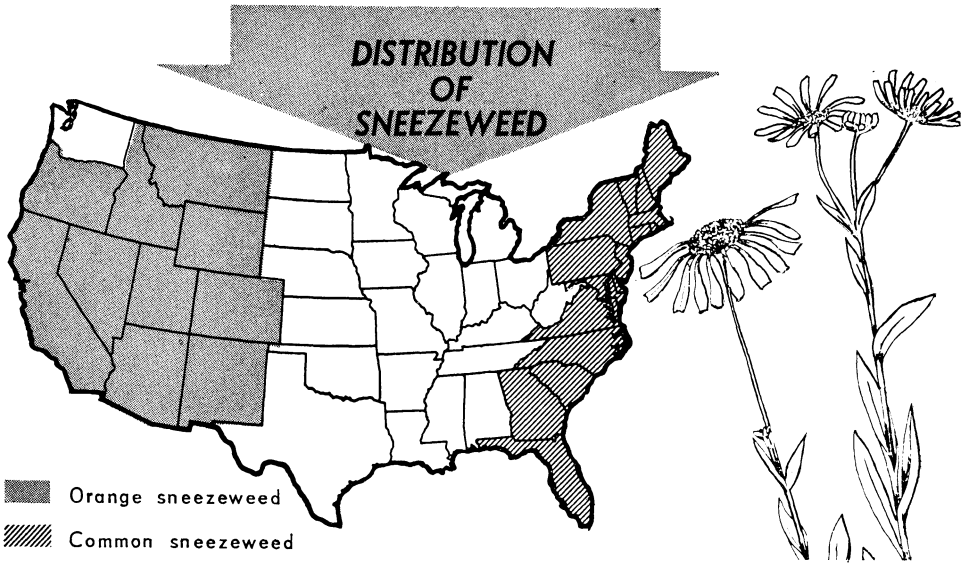
Two species of sneezeweed are especially poisonous to livestock. Orange sneezeweed,[1] which is found from western Montana and eastern Oregon southward to California and New Mexico, poisons sheep on the summer ranges of the intermountain region. Common sneezeweed [2] causes livestock losses in the Eastern States.

All plant parts are poisonous. The poisonous substance is a decomposed glucoside, which has a cumulative effect; an animal may die if it repeatedly eats small quantities of the plant over a long period.

Where and When It Grows

Orange sneezeweed grows at 5,000- to 12,000-foot elevations on moist slopes and in well-drained meadows. Common sneezeweed is found in wet areas and near streams. Both species start growth in early spring and mature in the summer and early fall.

[1] *Helenium hoopesii.*
[2] *H. autumnale.*



TN-17

Sneezeweed has one or several stems that grow 1 to 3 feet high. The leaves are alternate, lance shaped, and have a smooth edge. The flowers grow in clusters. They are orange colored and have dark-orange centers. A plant often develops a large crown, and is spread vegetatively by this crown. The plant is a perennial and belongs to the sunflower family.

How It Affects Livestock

About 2 pounds of sneezeweed leaves eaten daily by an animal for 10 days may produce poisoning and death.

Some animals may die within a few days after the first symptoms appear. Others become chronic cases, and may live for 2 to 3 weeks. Complete recovery from the poisoning is possible if animals are taken off the plants as soon as the first symptoms are observed.

Symptoms of sneezeweed poisoning

1. **Depression**
2. **Weakness**
3. **Irregular pulse**
4. **Frothing at the mouth**
5. **Coughing**
6. **Chronic vomiting or spewing**
7. **Bloating**

How To Reduce Livestock Losses

Livestock owners can prevent losses by following these range and livestock-management practices: (1) Provide animals throughout the summer grazing season with a daily mineral supplement, consisting of 70 pounds of trace mineralized salt and 30 pounds of dicalcium phosphate. (2) Remove animals to a brouse-type range area for 10 to 14 days if they show symptoms of poisoning. (3) Practice open herding and allow animals free movement. (4) Provide animals on bedgrounds with the mineral supplement each night. (5) Employ a dependable herder.

Confine affected animals to a pen in a shaded area; give them free access to fresh water and ample green feed.

To control plants, spray when sneezeweed is actively growing; use an ester of 2,4-D applied at the rate of 2 to 4 pounds of acid equivalent per acre. If necessary, give plants a followup spraying.

Keep animals away from treated areas to allow native vegetation to replace sneezeweed.

REDUCING LIVESTOCK LOSSES from *Water Hemlock* POISONING in the Western States

Water hemlock [1] is probably the most poisonous plant in the United States. Only a small amount of the toxic substance is necessary to produce poisoning in livestock—or in man.

The underground portions of the plant, especially the tuberous roots, are very dangerous. Severe livestock losses may occur when the roots become exposed and are eaten by animals. People are sometimes poisoned by eating the roots, which they mistake for wild parsnips.

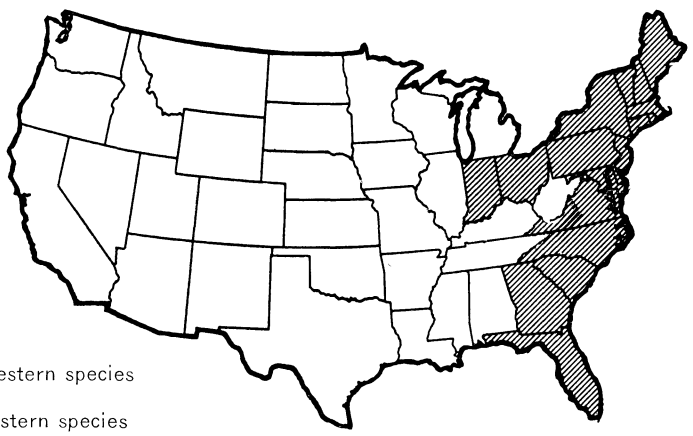
The toxic substance in water hemlock is cicutoxin, a thick yellowish liquid that has a strong carrotlike odor. It is found principally in the roots, but is also present in the leaves and stems during early growth. Leaves and stems lose most of their toxicity as they mature.

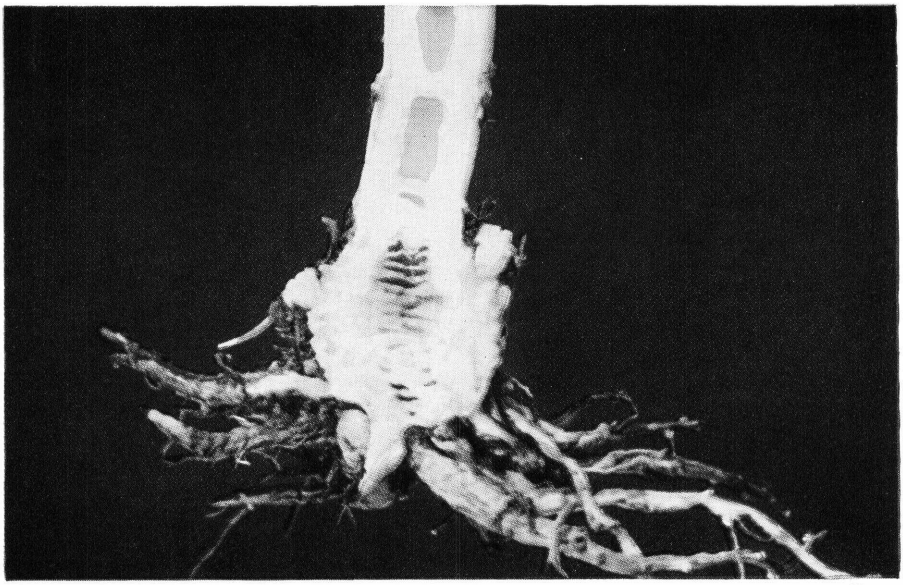
Where and When It Grows

Water hemlock, a wetland plant, is commonly found in wet meadows and pastures and along streams. It starts growth in the spring, and in the higher elevations flowers in June or July.

[1] *Cicuta douglasii* is a common species in the western range States where most livestock losses occur. *C. maculata* is a common species in the eastern States. About eight species of water hemlock occur in the United States.

DISTRIBUTION OF WATER HEMLOCK





TN-18

TN-19

Water hemlock has a thickened rootstock to which are attached roots that may be slender or may take the form of a group of thick, fleshy tubers. When cut longitudinally, the rootstock shows a number of transverse chambers that contain the toxic substance. A distinctive characteristic of the leaves is the arrangement of side veins; these veins lead to notches, not to the tips at the outer margin. Small, white flowers grow in umbrella-like clusters. The plant, a perennial, belongs to the parsley family.

IF POISONING OCCURS IN HUMAN BEINGS, IMMEDIATELY INDUCE VOMITING. CALL A DOCTOR.

How It Affects Livestock

Livestock usually show symptoms of poisoning 1 to 6 hours after they eat the plant; they may die within 1 to 2 hours after symptoms appear.

Symptoms of water hemlock poisoning

1. **Muscle twitching**
2. **Rapid pulse**
3. **Rapid breathing**
4. **Tremors**
5. **Convulsions**
6. **Dilation of the pupils**
7. **Excessive salivation**
8. **Frothing at the mouth**
9. **Coma**

How To Reduce Livestock Losses

Livestock owners can reduce losses by keeping animals away from places where water hemlock grows, and by eradicating the plants.

The plants usually grow in small patches, and are easy to locate and eradicate. They can be eradicated by grubbing or by spraying them with a herbicide, such as 2,4-D or 2,4,5-T. When plants are actively growing, apply a spray at the rate of 2 pounds of acid equivalent per acre. If they are grubbed, all plant parts, especially the roots, must be gathered and burned. If they are sprayed, followup treatments are necessary until eradication is completed.

There is no effective treatment for water hemlock poisoning. Toxic substances act so rapidly that an affected animal can seldom be saved.

U.S. GOVERNMENT PRINTING OFFICE : 1964

Know Poisonous Plants • Reduce Livestock Losses